

# **An Assessment of Tropical Dry- land Forest Management in Africa: What Are Its Lessons ?**

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*This presentation is based mainly on two discussion papers, both prepared for ESMAP (Energy Sector Management Assistance Program): “Sustainable Woodfuel Supplies from the Dry Tropical Woodlands” by Gerald Foley (1998), and “Dry Tropical Forest Management and Household Energy” by Michel Matly and myself (1999).*

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- ***More than 2 billion people still depend on woodfuel.***
  - ***Pressure on natural vegetation cover, especially for tropical dry-land forests (TDLF).***
  - ***Best practice now: “devolution of forest management to the local communities”.***
    - | *proven in practice*
    - | *cost effective*
    - | *simple & quick*
    - | *contributes to poverty alleviation and gender equity in rural areas*

# What Are Tropical Dry-Land Forests ?

- ***TDLF cover about 250 million hectares:***

- *64% in Africa (FAO, 1993).*
- *ranging from light scattered scrub to relatively dense woodland (savannah, miombo woodland).*
- *6 of the 7 categories of natural vegetation cover in sub-Saharan Africa are TDLF ('94 World Bank study, Millington and al)*



## ■ **Common characteristics**

- *low population density: 5-10 persons per sq km in low rainfall areas to less than 30 persons per sq km*
- *permanent disequilibrium; many dead trees; recurring cycles of severe and prolonged droughts followed by periods of high rainfall.*





# Human Impacts on TDLF: Facts and Beliefs

- ***TDLF areas have been altered irrevocably by human intervention,***
  - *does not mean productive capacity has been destroyed.*
- ***Modern research reverses the most deeply-held beliefs:***
  - *degradation can be reversed with proper intervention*
  - *rural population is not immature and destructive*
  - *the term deforestation is widely but imprecisely used*



# Major causes of deforestation ?

## ■ **Farming**

- account for 90% or more of deforestation, but loss of standing stock could be surprisingly low

## ■ **Use of fire**

- used at least for 2,500 years in Africa
- in most case, fire are well controlled

## ■ **Pastoralism**

- a critically important element for the TDLF ecology

## ■ **Woodfuel gathering for rural use**

- impact very limited on the resource

## ■ **Woodfuel harvesting for urban market supply**

- large scale and concentrated, but do not generally destroy the regeneration capacity
- concern less than 1 or 2% of the total wooded areas



# Emergence of the “woodfuel crisis”

- ***“Woodfuel crisis” - also called the “other energy crisis” (Eckholm, 1976)***
- ***CILSS & Club du Sahel predicted that “... in the absence of vigorous action now, much of the Sahel region will have become a desert by the year 2000.”***
- ***In 1981, FAO woodfuel map: projecting that 2.4 billion of people will face an acute woodfuel scarcity by the year 2000 (de Montalembert and Clement, 1983)***
- ***World Bank 1984: accelerating “gap” between the supply and demand of woodfuel (Newcombe)***
- ***Result: major donor financed activities***
- ***but most of these activities failed***

# Failures & Step-By-Step Learning

- *Improved cooking stoves*
- *Improved charcoal-making techniques*
- *Interfuel substitution*
- *Forestry plantations*
- *Farm and community forestry*
- *Legal and fiscal measures*





# Exaggerated Woodfuel Problem

- *The woodfuel crisis was greatly exaggerated.*
- *It did draw attention of Governments and donor agencies, but has largely prejudiced the interpretation of problems and the design of solutions.*
- *The fault lays in the weakness of the widely used “energy gap” approach (comparison of woodfuel consumption with annual biomass growth):*
  - *underestimate standing stocks (diameter of tree, exclude farm trees, etc.)*
  - *new studies indicate that yields may be considerably higher*
  - *no accurate data on charcoal transition & interfuel substitution*
  - *“gap” model has high sensitivity.*

# Re-Interpreting the Woodfuel Problem

## ■ **Deforestation:**

- *not a structural and fundamentally insoluble problem,*
- *but temporary mutations and adaptations between societies and the environment.*

## ■ **Woodfuel harvesting:**

- *woody resources are a country's assets, which should be valued appropriately (short-term & long-term),*
- *woodfuel business constitutes a sector of major economic importance*
- *an opportunity for rural communities to earn a sustainable cash income.*

# Towards a Sustainable Woodfuel Supply

- **Three principles for intervention:**
  - (i) to geographically redirect and rationalize the woodfuel harvesting
  - (ii) management by rural people
  - (iii) woodfuel harvesting is legitimate business



# TDLF Management Tools

## ■ **Four tools:**

- (i) *woodfuel supply master plan*
- (ii) *rural woodfuel markets (with simple forestry management plans)*
- (iii) *environmental monitoring*
- (iv) *regulatory and tax reform.*





# Woodfuel Supply Master Plan

- *covers economically-viable woodfuel catchment areas*
- *is an irreplaceable monitoring and land-planning tool*
- *defines notably the geographic priorities, forms of action to implement and harvesting guidelines to respect*
- *not a rigid planning tool, provides priorities for intervention and develops guidelines; it also provides the means to monitor progress.*
- *is based on cross-analysis of:*
  - *(i) available woody resources;*
  - *(ii) woodfuel flows; and*
  - *(iii) human dynamics*
- *uses efficient and modern techniques, such as satellite imagery, GPS field survey, in-depth socio-economic surveys, and GIS data base and mapping*

## Carte n°7



# Rural Woodfuel Market (RWM)

- ***Developed by World Bank Household Energy Project in Niger (1989-96)***
- ***a self-sustaining natural woodland management system***
- ***a place where woodfuel dealers can buy firewood and charcoal***
- ***operated by a village level association***
- ***set the selling prices of woodfuel independently***
- ***collect woodfuel tax and deliver permits***
- ***a simple plan agreed between the village association and the local forestry service:***
  - ***(i) an annual woodfuel quota; and (ii) a set of very simple woodfuel cutting and forestry rules.***
- ***creation of a RWM is subject to prior official agreement***



# RWM Experience

## ■ ***In Niger:***

- *RWM managed woodland area ranges between 2,000 and 5,000 ha*
- *creation of a RWM, including management plan design, costs no more than US\$ 20,000 (< US\$ 10/ha)*
- *60 RWM still operational, 5 yrs after project termination*
- *each RWM generates average annual incomes of F CFA 2 million per year (about US\$ 300,000 per year) and F CFA 200,000 per year of tax revenues*
- *tax revenues have been used for building or rehabilitation of health unit, school and mosque, repairing water pumping system, vaccination campaign, etc.*

## ■ ***Situation is likely similar in Mali, but this is the subject of the next presentation***

## ■ ***TDLF management and RWM development provide great Decentralization tool***



## Other TDLF Management Tools

- **Environmental monitoring:**
  - *provide feedback & fine tuning*
  - *enlithening of local authorities and rural populations*
- **Regulatory and tax reform:**
  - *enable RWMs development*
  - *provide incentives for woodfuel dealers to go to RWM*
  - *require efficient control system*
  - *over time the system will become less important, and eventually obsolete when all areas are under community management.*



# Acting on the Demand Side

## ■ ***Four principles:***

- *(i) understand market and consumer behaviors*
- *(ii) individual decision to shift to a new fuel or a new stove*
- *(iii) promote private sector investment in the household fuel business*
- *(iv) open new markets for woodfuel*

# Demand Management Tools

- **Price follow-up**
  - *provide crucial feedback on sector evolution*
- **Permanent consumer panels**
  - *indispensable for properly preparing marketing actions and assessing their impacts*
  - *some hundreds families per city*



# Others Demand Management Tools

- **Improved stoves**
  - *taking into account the large experience gained*
- **Diversification of fuels and stoves**
- **Support to new market development**
  - *the foretold death of woodfuel as cooking fuel*
  - *make use of existing well-structured woodfuel supply chains*







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